UNDERWATER BRIDGE INSPECTION REPORT

STRUCTURE NO. 27537

1ST AVENUE

OVER THE

EAST CHANNEL OF THE MISSISSIPPI RIVER

DISTRICT 5 - HENNEPIN COUNTY

PREPARED FOR THE

MINNESOTA DEPARTMENT OF TRANSPORTATION

BY

COLLINS ENGINEERS, INC.

JOB NO. 5221 (CEI 118)

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

REPORT SUMMARY:

The substructure units inspected at Bridge No. 27537, Piers 2 and 3, were found to be in good condition with no defects of structural significance observed. There was minor footing exposure along the west side of Pier 2. Light to heavy accumulations of timber debris were observed along the upstream noses of Piers 2 and 3. The channel bottom appeared stable with no evidence of significant scour and with no significant changes since the previous inspection.

INSPECTION FINDINGS:

(A) Footing exposure, with top at 6.2 feet below the waterline, was observed at the west face of Pier 3 and with a maximum vertical exposure of 1 foot. The footing's surface was rough with some irregularities. Steel sheet piling was observed from the midpoint to the downstream nose.

(B) A light accumulation of timber debris, consisting of 1 foot in diameter logs and branches, was observed at the upstream end of Pier 3.

(C) A moderate to heavy accumulation of timber debris was observed at the upstream end of Pier 2 between the channel bottom and the waterline, consisting of 1 to 2 feet diameter and smaller logs and branches, that extended towards the west shore.

(D) Vertical cracks, 1/16 inch maximum width, were observed on both faces of Pier 2, and on the west face of Pier 3.

RECOMMENDATIONS:

(A) Monitor the timber debris at Piers 2 and 3, and if found to be increasing in the future, removal operations may become warranted.

(B) Reinspect the submerged substructure units at the normal maximum recommended (NBIS) interval of five (5) years.

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Daniel G. Stromberg

Date 6/30/2008 Registration No. 21491

Respectfully submitted,

COLLINS ENGINEERS, INC.

Daniel G. Stromberg
Registered Professional
Engineer, State of Minnesota

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

1. BRIDGE DATA

Bridge Number: 27537

Feature Crossed: East Channel of the Mississippi River

Feature Carried: 1ST Avenue

Location: District 5 – Hennepin County

Bridge Description: The bridge superstructure consists of four spans of multiple steel beams. The superstructure is supported by two reinforced concrete abutments and three reinforced concrete piers. The piers have spread footings that are keyed into rock, and the abutments are supported by timber piles. The piers are numbered 1 through 3 starting from the south end of the bridge.

2. INSPECTION DATA

Professional Engineer/Team Leader: Daniel G. Stromberg, P.E., S.E.

Dive Team: Clayton G. Brookins, Valerie Roustan

Date: October 4, 2007

Weather Conditions: Sunny, 65°F

Underwater Visibility: 0.5 foot

Waterway Velocity: 0.5 f.p.s

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: Piers 2 and 3

General Shape: Piers 2 and 3 each consist of two square columns which are supported by a rectangular shaft with rounded noses. The pier footings are rectangular and are keyed into rock.

Maximum Water Depth at Substructure Inspected: Approximately 9.5 feet.

4. WATERLINE DATUM

Water Level Reference: The benchmark reference at Elevation 802.5 located on Pier 3.

Water Surface: The waterline was approximately 3.4 feet below reference.
Waterline Elevation = 798.7.

5. NBIS CODING INFORMATION (Minnesota specific codes are used for 92B and 113)

Item 60: Substructure: Code 7

Item 61: Channel and Channel Protection: Code 6

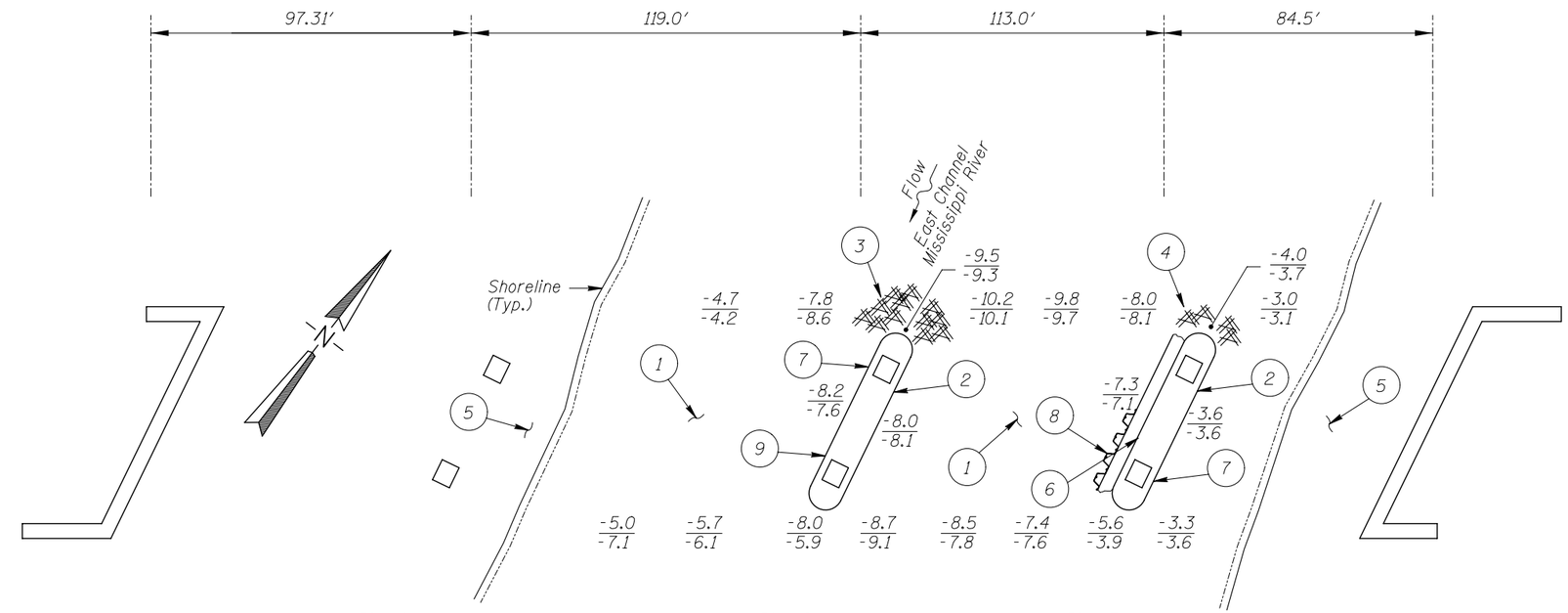
Item 92B: Underwater Inspection: Code B/10/07

Item 113: Scour Critical Bridges: Code R/02

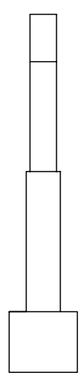
Bridge is scour critical because abutment or pier foundation is rated as unstable due to observed scour at bridge site.
X Yes _____ No

Photograph 1. View of Pier 2 and Timber Debris, Looking Southeast.


Photograph 2. View of Pier 3, Looking East.



SOUNDING PLAN



TYPICAL END VIEW OF PIERS

GENERAL NOTES:

1. Piers 2 and 3 were inspected underwater.
2. At the time of inspection on October 4, 2002 the waterline was located approximately 3.4 feet below the benchmark reference at Elevation 802.5 on Pier 3. Based on the reference this corresponds with a waterline elevation of 798.7.
3. Soundings indicate the water depth at the time of inspection and are measured in feet.
4. Soundings were taken parallel to the bridge at 1/4 point intervals between the substructure units.

INSPECTION NOTES:

(1) The channel bottom consisted of silty sand and scattered cobbles with up to 1 foot of probe rod penetration.

(2) The concrete piers exhibited light scaling from 1.5 foot above to 1 foot below the waterline.

(3) A moderate to heavy accumulation of timber debris was observed at the upstream end of Pier 2 on the channel bottom, consisting of 1-to-2-foot-diameter and smaller logs and branches that extended towards the west shore.

(4) A light accumulation of timber debris, consisting of 1 foot-diameter, logs and branches was observed at the upstream end of Pier 3.

(5) Both embankments were well armored with grouted riprap.

(6) Vertical cracks 1/16 inch wide were observed along the west face of Pier 3, extending from channel bottom to top of pier shaft.

(7) Overall concrete was smooth and sound.

(8) Footing exposure (top at 6.2 feet below waterline) was observed at the west face of Pier 3. The footing's surface was rough with some irregularities. Steel sheet piling was observed along footing from the midpoint to the downstream nose with a maximum vertical exposure of 1 foot (footing and sheeting).

(9) Vertical cracks (1/16 inch maximum width) were observed along east face (5 cracks) and west face (3 cracks) of Pier 2, extending from channel bottom to top of pier shaft.

Legend

-3.0	Sounding Depth (10/1/07)
-2.2	Sounding Depth (9/29/02)
	Timber Debris

Note:

All soundings based on 2007 waterline location.

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DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

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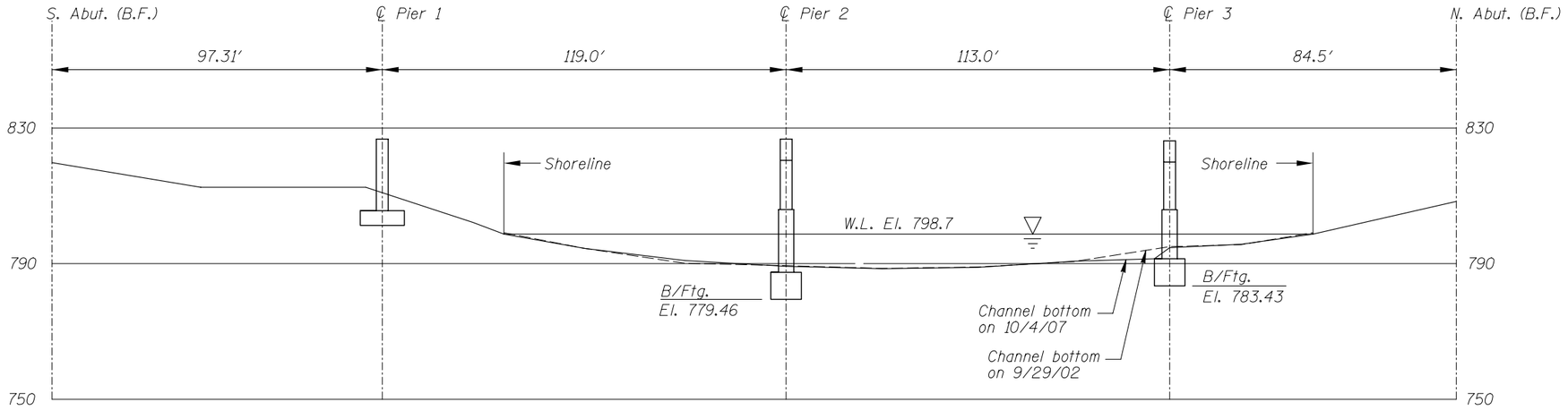
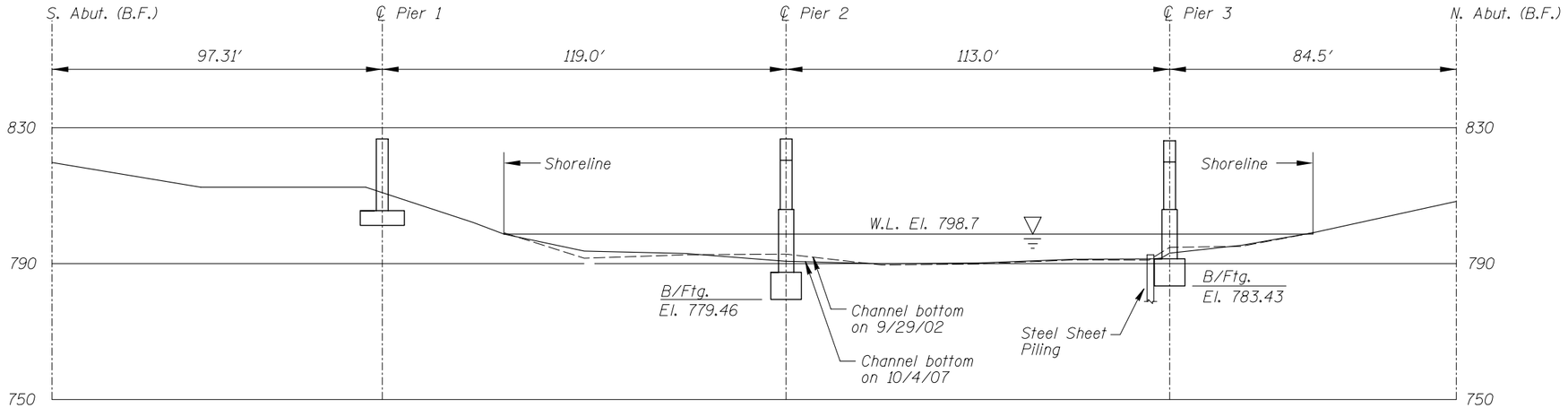
OVER THE EAST CHANNEL OF THE MISSISSIPPI RIVER
DISTRICT 5, HENNEPIN COUNTY

INSPECTION AND SOUNDING PLAN

Drawn By: PRH	COLLINS ENGINEERS, Inc. 123 North Wacker Drive Suite 300 Chicago, Il. 60606 (312) 704-9300 www.collinsengr.com	Date: OCT., 2007
Checked By: MDK		Scale: NTS
Code: 52210118		Figure No.: 1



UPSTREAM FASCIA PROFILE



DOWNSTREAM FASCIA PROFILE

Note:

Refer to Figure 1 for General Notes.

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UPSTREAM AND DOWNSTREAM
FASCIA PROFILES

Drawn By: PRH	COLLINS ENGINEERS, INC. 123 North Wacker Drive Suite 300 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com	Date: OCT., 2007
Checked By: MDK		Scale: 1"=40'
Code: 52210118		Figure No.: 2

MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF BRIDGES AND STRUCTURES
DAILY DIVING REPORT

INSPECTORS: Collins Engineers, Inc. DATE: October 4, 2007
ON-SITE TEAM LEADER: Daniel G. Stromberg, P.E., S.E.
BRIDGE NO: 27537 WEATHER: Sunny, 65°F
WATERWAY CROSSED: East Channel of the Mississippi River
DIVING OPERATION: X SCUBA _____ SURFACE SUPPLIED AIR
_____ OTHER
PERSONNEL: Clayton G. Brookins, Valerie Roustan
EQUIPMENT: Scuba, U/W Light, Probe Rod, Lead Line, Sounding Pole, Fathometer, Scraper, Camera
TIME IN WATER: 12:50 p.m.
TIME OUT OF WATER: 1:00 p.m.
WATERWAY DATA: VELOCITY 0.5 f.p.s
VISIBILITY 0.5 foot
DEPTH 9.5 feet maximum at Pier 2
ELEMENTS INSPECTED: Piers 2 and 3
REMARKS: Overall, the concrete of the piers was smooth and sound. Light to heavy accumulations of timber debris were observed at the upstream end of Piers 2 (heavy) and 3 (light). Footing exposure was observed at the west face of Pier 3. The footing's surface was rough with some irregularities, and there was a maximum vertical exposure of 1 foot. Steel sheet piling was observed above the channel bottom along the Pier 3 footing from the upstream quarter point to the downstream nose of the pier. Vertical cracks, 1/16 inch maximum width, were observed on both faces of Pier 2, and on the west face of Pier 3 only.

FURTHER ACTION NEEDED: _____ YES X NO

Monitor the timber debris at Piers 2 and 3, and if found to be increasing in the future, removal operation may become warranted.

Reinspect the submerged substructure units at the normal maximum recommended (NBIS) interval of five (5) years.

MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF BRIDGES AND STRUCTURES

UNDERWATER INSPECTION CONDITION RATING FORM

BRIDGE NO. 27537
INSPECTORS Collins Engineers, Inc.
ON-SITE TEAM LEADER Daniel G. Stromberg, P.E., S.E.
WATERWAY CROSSED East Channel of the Mississippi River

INSPECTION DATE October 04, 2007

NOTE: USE ALL APPLICABLE CONDITION DEFINITIONS AS DEFINED IN THE MINNESOTA RECORDING AND CODING GUIDE INCLUDING GENERAL, SUBSTRUCTURE, CHANNEL AND PROTECTION, AND CULVERTS AND WALL DEFINITIONS TO COMPLETE THIS FORM.

CONDITION RATING

			SUBSTRUCTURE						CHANNEL					GENERAL					
UNIT REFERENCE NO.		MAXIMUM DEPTH OF WATER	PILING	COLUMNS, SHAFTS, OR FACES*	FOOTINGS	DISPLACEMENT	OTHER	OVERALL SUBSTRUCTURE CONDITION CODE*	SCOUR	EMBANKMENT EROSION	EMBANKMENT PROTECTION	OTHER (DRIFT/DEBRIS)	OVERALL CHANNEL & PROTECTION CONDITION	CONCRETE	STEEL	TIMBER	LOSS OF SECTION	PREVIOUS REPAIR OR MAINTENANCE	OTHER
	UNIT DESCRIPTION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
	Pier 2	9.5’	N	7	N	9	N	7	7	8	8	5	5	7	N	N	N	N	N
	Pier 3	7.3’	N	7	N	9	N	7	7	8	8	7	7	7	N	N	N	N	N

*UNDERWATER PORTION ONLY

REMARKS: Overall, the concrete of the piers was smooth and sound. Light to heavy accumulations of timber debris were observed at the upstream end of Piers 2 (heavy) and 3 (light). Footing exposure was observed at the west face of Pier 3. The footing’s surface was rough with some irregularities, and there was a maximum vertical exposure of 1 foot. Steel sheet piling was observed above the channel bottom along the Pier 3 footing from the upstream quarter point to the downstream nose of the pier. Vertical cracks, 1/16 inch maximum width, were observed on both faces of Pier 2, and on the west face of Pier 3 only.

NOTES: ATTACH SKETCHES AS NEEDED, IDENTIFY REMARK BY REFERRING TO UNIT REFERENCE NO. AND REMARK NO.
USE GENERAL SECTION TO IDENTIFY OVERALL PRESENCE OF SPALLS, CRACKS, CORROSION, ETC.